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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/089,026	07/02/2002	Pierre Siohan	F40.12-0005	9446

27367 7590 06/13/2007  
WESTMAN CHAMPLIN & KELLY, P.A.  
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MINNEAPOLIS, MN 55402-3319

EXAMINER
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PHUNKULH, BOB A

ART UNIT	PAPER NUMBER
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2616

MAIL DATE	DELIVERY MODE
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06/13/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/089,026

Applicant(s)

SIOHAN ET AL.

Examiner

Bob A. Phunkulh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 and 11-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6, 8-9, 11-21 is/are rejected.
- 7) ☒ Claim(s) 5 and 7 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 3/8/2007.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

This communication is in response to applicant's 03/08/2007 amendment(s)/response(s) in the application of **SIOHAN et al.** for **"METHOD FOR TRANSMITTING AN OFFSET MODULATED BIORTHOGONAL MULTICARRIER"** filed 03/26/2002. The amendment/response to the claims have been entered. Claim 10 has been canceled. No claims have been added. Claims 1-9, 11-21 are now pending.

### ***Drawings***

The drawings are objected to because numbers and letters are small (difficulties of reading) and are not well defined. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required

corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

Claim 19 is objected to because of the following informalities: in the preamble of the claim cited "apparatus according to claim 20," but the parent claim 20 is a demodulation device. Appropriate correction is required.

Claims 1-9, 11, 13-14, 17-19, 21, are objected to because of the following informalities: please correct the subject matter "characterized" to —comprising—for the subject matter is not current USPTO acceptable practice. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 6, 12, 15-21 are rejected under 35 U.S.C. 102(b) as being anticipated by *KOBER* et al. (US 6,252,535), hereinafter *KOBER*.

Regarding claim 1, *KOBER* discloses a method for transmitting a biorthogonal frequency division multiplex/offset modulation (BFDM/OM) biorthogonal multicarrier signal (intended used, therefore no patentable weight given) characterized in that it implements a transmultiplexer structure providing:

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a modulation step, by means of a bank of synthesis filters, having  $2M$  parallel branches,  $M > 2$ , each fed by source data and each comprising an expander of order  $M$  and filtering means (see col. 5 lines 35-49); and

a demodulation step, by means of a bank of analysis filters, having  $2M$  parallel branches, each comprising a decimator of order  $M$  and filtering means, and delivering representative data received from the source data (col. 3 lines 7-12),

the filtering means being derived from a predetermined prototype modulation function.

Regarding claim 2, *KOBER* discloses in that the filtering means of the bank of synthesis filters and/or of the bank of analysis filters are grouped as a polyphase matrix, respectively (see col. 3 lines 7-12; and col. 5 line 62 to col. 6 line 6).

Regarding claim 3, *KOBER* discloses at least one of the polyphase matrices comprises a reverse Fourier transform with  $2M$  inputs and  $2M$  outputs (a known transform, see col. 5 line 62 to col. 6 line 6).

Regarding claim 12, *KOBER* discloses a method for modulating a biorthogonal frequency division multiplex/offset modulation (BFDM/OM) biorthogonal multicarrier signal, characterized in that it implements a bank of synthesis filters having  $2M$  parallel branches,  $M > 2$ , each fed by source data and each comprising an expander of order  $M$

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and filtering means, the filtering means being derived from a predetermined prototype modulation function (see col. 5 lines 34-49).

Regarding claim 4, *KOBER* it implements a reverse Fourier transform (a known transform) fed by  $2M$  branches, themselves fed by the transmitted signal, and each comprising a decimator of order  $M$  followed by a filtering module, and feeding  $2M$  phase shift multipliers, delivering an estimation of the source data (a known transform, see col. 5 line 62 to col. 6 line 6).

Regarding claim 15, *KOBER* discloses a method for demodulating a biorthogonal frequency division multiplex/offset modulation (BFDM/OM) biorthogonal multicarrier signal characterized in that it implements a bank of analysis filters having  $2M$  parallel branches, each comprising an expander of order  $M$  and filtering means, and delivering representative data received from source data, the filtering means being derived from a predetermined prototype modulation function (see col. 5 lines 34-49).

Regarding claim 6, *KOBER* it implements a reverse Fourier transform (a known transform) fed by  $2M$  branches, themselves fed by the transmitted signal, and each comprising a decimator of order  $M$  followed by a filtering module, and feeding  $2M$  phase shift multipliers, delivering an estimation of the source data (a known transform, see col. 5 line 62 to col. 6 line 6).

Regarding claim 16, *KOBER* discloses an apparatus comprising: a modulating device for modulating a biorthogonal frequency division multiplex/offset modulation (BFDM/OM) biorthogonal multicarrier signal, characterized by a bank of synthesis filters having  $2M$  parallel branches,  $M \geq 2$ , each fed by source data and each comprising an expander of order  $M$  and filtering means, the filtering means being derived from a predetermined prototype modulation function (see col. 5 lines 34-49).

Regarding claim 17, *KOBER* it implements a reverse Fourier transform (a known transform) fed by  $2M$  branches, themselves fed by the transmitted signal, and each comprising a decimator of order  $M$  followed by a filtering module, and feeding  $2M$  phase shift multipliers, delivering an estimation of the source data (a known transform, see col. 5 line 62 to col. 6 line 6).

Regarding claim 18, *KOBER* discloses a demodulation device for demodulating a BFDM/OM biorthogonal multicarrier signal characterized by: a bank of analysis filters having  $2M$  parallel branches, each comprising an expander of order  $M$  and filtering means, and delivering representative data received from source data, the filtering means being derived from a predetermined prototype modulation function (see col. 5 lines 34-49).

Regarding claim 20, *KOBER* discloses a demodulation device for demodulation a biorthogonal frequency division multiplex/offset modulation (BFDM/OM) biorthogonal

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multicarrier signal characterized by a bank of analysis filters having 2M parallel branches, each comprising an expander of order M and filtering means, and delivering representative data received from source data, the filtering means being derived from a predetermined prototype modulation function (see col. 5 lines 34-49).

Regarding claims 19, 21, *KOBER* it implements a reverse Fourier transform (a known transform) fed by 2M branches, themselves fed by the transmitted signal, and each comprising a decimator of order M followed by a filtering module, and feeding 2M phase shift multipliers, delivering an estimation of the source data (a known transform, see col. 5 line 62 to col. 6 line 6).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 9, 11, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over *KOBER* in view of Applicant's Admitted Prior Art (AAPA).

Regarding claims 9, 11 and 14, *KOBER* fails to disclose the signal is an OFDM/OM signal.

AAPA discloses that it is well known in the art that OFDM/OM has the advantage of operat[ing] without any guard interval and also provid[ing] a wider possibility of choice



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as regards the prototype function" (e.g., see applicant's specification at page 2, lines 8-18). Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to implement an OFDM/OM signal in *KOBER* in order to provide the well known advantage of "operat[ing] without any guard interval and also provid[ing] a wider possibility of choice as regards the prototype function" (e.g., see applicant's specification at page 2, lines 8-18).

Claims 8, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over *KOBER*.

Regarding claims 8 and 13, *KOBER* fails to disclose the filters are belong to group comprising: one of transverse structure filters, ladder structure filters, or trellis structure filters, Examiner takes official notice that grouping filters one of transverse structure filters, ladder structure filters, or trellis structure filters is well known in the art of filtering for providing efficient filtering means. Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to group the filters in *KOBER* as one of transverse structure filters, ladder structure filters, or trellis structure filters since such grouping of filters is well known in the art of filtering for providing efficient filtering means.

#### ***Allowable Subject Matter***

Claims 5, 7, are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

Applicant's arguments with respect to claims 1-4, 6, 8-9, 11-21 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

**Any response to this action should be mailed to:**

The following address mail to be delivered by the United States Postal Service (USPS) only:

Mail Stop \_\_\_\_\_  
Commissioner for Patents  
P. O. Box 1450  
Alexandria, VA 22313-1450

**or faxed to:**

(571) 273-8300, (for formal communications intended for entry)

**Or:**

The following address mail to be delivered by other delivery services (Federal Express (Fed Ex), UPS, DHL, Laser, Action, Purolater, Hand Delivery, etc.) as follow:

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220 20<sup>th</sup> Street South  
Customer Window, Mail Stop \_\_\_\_\_  
Crystal Plaza Two, Lobby, Room 1B03  
Arlington, VA 22202.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Bob A. Phunkulh** whose telephone number is **(571) 272-3083**. The examiner can normally be reached on Monday-Tuesday from 8:00 A.M.

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to 5:00 P.M. (first week of the bi-week) and Monday-Friday (for second week of the bi-week).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor **Wellington Chin**, can be reach on **(571) 272-3134**. The fax phone number for this group is **(571) 273-8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Bob A. Phunkulh  
Primary Examiner  
TC 2600

*Technology Division 2616*  
*May 24, 2007*